REMARKS/ARGUMENTS

In paragraph 1 of the Detailed Action, the Examiner has objected to Figures 1, 2A, 2B, 3A, 3B, and 3C as not being labelled Prior Art. Figures 1, 2A, 2B, 3A, 3B, and 3C have been labelled Prior Art. The Examiner is respectfully requested to withdraw the objection to the drawings.

In the Office Action Summary claims 1-3, 5, 6, and 8-19 are indicated as being allowed; however, this is inconsistent with the remainder of the Detailed Action in which claims 1-3, 5, 6, and 8-19 are rejected. It appears that claims 1-3, 5, 6, and 8-19 should have been indicated as being rejected in the Office Action Summary.

In paragraph 3 of the Detailed Action, the Examiner has rejected claims 1, 3, 6, 8, 10, 11, and 13 under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 5,440,418 (Ishimura *et al.*). Given below is a brief description of the present invention and of Ishimura *et al.* followed by a detailed discussion on how claims 1, 3, 6, 8, 10, 11, and 13 are patentable over Ishimura *et al.*

The Present Invention

A method and system of verifying if a fiber connection between a first optical component and a second optical component in an optical system is correct is provided. The method involves the use of a port identification message which is transmitted from the first optical component to the second optical component over a dedicated communications channel running parallel to the fibre connection. The port identification message at the second optical component and information identifying the second optical component is conveyed to a processing agent. The port identification message and the information identifying the second optical component is checked against a predefined connection model which is stored in the processing agent to determine if the connection is correct. An indication of whether there is a correct connection or a misconnection is provided. Applicant emphasizes that the method described above is a method of verifying if a <u>fiber connection</u> <u>between a first optical component and a second optical</u>

component is correct. An exemplary embodiment in which the method is applied is shown in Figure 4. In particular, in Figure 4 the above method can be applied to an amplifier-to-OSC-card (amplifier-to-(Optical Service Channel)-card) connection 420, and an amplifier-to-multiplexer connection 426 or an amplifier-to-demultiplexer connection 428 and amplifier-to-midstage access (MSA) element connections 424.

Ishimura *et al.*

Ishimura *et al.* disclose optical repeaters in an optical transmission system for transmitting an optical signal. In particular, Ishimura *et al.* disclose control management of the optical transmission system and the optical repeater apparatuses. An optical repeater is shown in Figure 1 of Ishimura *et al.* and a connection of three of the optical repeaters A, B, C is shown in Figure 2 of Ishimura *et al.* The optical repeaters A, B, C utilize a common frequency for modulating a management signal at each optical repeater. Furthermore, the system of Ishimura *et al.* provides an optical transmission system in which a failure point is detected. Failure points correspond to the optical repeaters. The optical transmission system makes use of management information which is sent from one repeater to another; however, this management information is limited to information as to what is happening at the repeaters and there is no information regarding the fiber connections between the repeaters A, B, C. As such, Ishimura *et al.* have nothing to do with a method of verifying if a fiber connection between a first optical component and a second optical component is correct. Instead, what is being monitored is what is happening at the optical repeaters A, B, C.

Claims 1, 8, and 13.

Claim 1 is directed to (in an optical system comprising a plurality of interconnected optical components) a method of verifying if a fiber connection between a first optical component and a second optical component is correct. With respect, as discussed above Ishimura *et al.* have nothing to do with verification of any connection between a first optical component and a second optical component. Instead Ishimura *et al.* disclose detection of failure points which correspond to optical repeaters.

Claim 1 recites:

"storing a predefined connection model in a processing agent".

The Examiner has referred to column 2, lines 39 to 43 of Ishimura *et al.* as disclosure for this claim feature. With respect, this passage discloses how a control command interface 15 (see Figure 1) is connected to a TMN (Telecommunication Management Network) and control commands are transmitted on the TMN. With respect, there is no disclosure of storing any predefined connection model in a processing agent. Furthermore, the Examiner has identified the control circuit 14, the control command interface 15, and the TMN as the processing agent. Applicant cannot find any disclosure in Ishimura *et al.* of storing a predefined connection model in the circuit 14, the interface 14, or the TMN.

Claim 1 recites:

"generating a port identification message at the first optical component".

The Examiner has not referred to any passage in Ishimura *et al.* for disclosure of this claim feature; however, the Examiner appears to be equating port identification message with "management information". With respect, the management information referred to in Ishimura *et al.* has nothing to do with a "port identification message". In particular, in column 3, lines 24 to 33 the management information is specifically defined. In particular, this passage recites:

"the management information generated at the control circuit 14 is as follows:

NOR (Normal): indicates that the monitoring information amplifier is Normal.

LOS (Loss of Signal): indicates that the monitoring information is "Loss of Signal".

RF (Repeater Failure): indicates that the monitoring information is amplifier failure.

MSF (Management Section Failure): indicates the failure in the management function of the optical repeater".

With respect, the management information has nothing to do with a port identification message but rather simply contains information relating to status information at the optical

repeater. With respect, as discussed above Ishimura *et al.* deal with a completely different problem than that contemplated in claim 1 which is directed to a method of verifying if a fiber connection between a first optical component and a second optical component is correct. As such, in Ishimura *et al.* there is no need for any port identification message as contemplated in claim 1.

Claim 1 recites:

"transmitting the port identification message from the first optical component to the second optical component over a dedicated communications channel running parallel to the fiber connection".

The Examiner has equated "management information" with "port identification message". With respect, as discussed above there is no disclosure in Ishimura *et al.* of any port identification message. As such, there can be no disclosure of transmitting such a port identification message.

Claim 1 recites:

"conveying the port identification message received at the second optical component and information identifying the second optical component to the processing agent".

Again, in Ishimura *et al.* there is no disclosure of any port identification message. As such, there can be no conveying of any port identification message.

Claim 1 also recites:

"checking the port identification message and information identifying the second optical component against the predetermined connection model stored in the processing agent to determine if the connection is correct".

Once again, there is no disclosure of any port identification message in Ishimura *et al.* As such, there can be no checking of such a port identification message. Furthermore, as discussed above in Ishimura *et al.* there is no predefined connection model stored in a processing agent. As

such, there can be no checking of any port identification message and information identifying the second optical component against the predetermined connection model stored in the processing agent to determine if the connection is correct. Finally, the Examiner has not identified any passage in Ishimura *et al.* for this claim feature.

As indicated above, not all of the features of claim 1 are disclosed in Ishimura *et al.* and so claim 1 is allowable. Claims 8 and 13 should also be allowed for the same reasons.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 102(b) rejection of claims 1, 8, and 13.

Claims 3 and 10

Claims 3 and 10 depend on claims 1 and 8, respectively, and should be allowed for the same reasons as discussed above with reference to claims 1 and 8.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 102(b) rejection of claims 3 and 10.

Claim 6

Claim 6 depends on claim 1 and should be allowed for the same reasons as discussed above with reference to claim 1.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 102(b) rejection of claim 6.

Claim 11

Claim 11 depends on claim 10 and should be allowed for the same reasons as discussed above with reference to claim 10.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 102(b) rejection of claim 11.

In paragraph 4 of the Detailed Action, the Examiner has rejected claims 14 to 19 under 35

U.S.C. 102(b) as being anticipated by United States Patent No. 5,859,716 (O'Sullivan *et al.*). Given below is a brief description of the O'Sullivan *et al.* reference followed by a detailed discussion on how claims 14 to 19 are patentable over O'Sullivan *et al.*

O'Sullivan *et al.*

O'Sullivan discloses an apparatus and method for trouble shooting a transmission system comprising optical line amplifiers (OAs). Each OA is equipped with a self-stimulation signal detection unit for generating a low frequency local code unique to the transmission system and dithering the outgoing signal in a controlled manner with the local code. Each OA attempts to detect its local code in the incoming signal by comparing the energy of the transmitted and received dithers. The presence of the local code in the incoming signal initiates alarms which unequivocally identify the faulted OA. Each OA selects its local code out of a bank of local codes, according to a priority scheme and re-selects its local code in case of conflicts. An example is shown in Figure 1 in which an amplifier 10 receives incoming signals 2 and 3′ and outgoing signals 3 and 2′ are modulated with a dither D_{1j}. No dither should be detected by unit 110 in the incoming optical signal 2 transmitted from terminal 60 to terminal 70. If a reflection has occurred in a direction 60 to 70, a unit 110 will detect a locally generated code C_{1j} in an incoming signal 11. The ratio of the energy in the dither D_{i1} detected in the incoming signal and the energy in the transmitted dither D_{1j} gives the value of reflection. With respect, as will be discussed further below in O'Sullivan *et al.* there is no predefined connection model that is stored in a processing agent and there is no checking of any dither against the predetermined connection model.

Claim 14

Claim 14 is directed to a method of verifying if a fiber connection between a first optical component and a second optical component is correct in an optical system comprising a plurality of interconnected optical components and recites:

"storing a predefined connection model in a processing agent".

The Examiner has referred to Figures 1 and 2; column 2, lines 37 to 55; column 4, lines 24 to 67; and column 5, lines 1 to 6 as disclosure for this claim feature and all of the other claim features of claim 14. With respect, these passages disclose how the system of Figures 1 and 2 of O'Sullivan *et al.* make use of dithers D_{ij} applied at each amplifier using local codes C_{ij} which encode the intensity of light of laser pump with a known modulation depth. A local code is unique to a respective amplifier. Reflections are detected using the ratio of the energy in the received and transmitted dithers. With respect, the local codes C_{ij} have nothing to do with a predefined <u>connection</u> model and there is no need or indeed any disclosure of any predefined connection model being stored in a processing agent. Claim 14 also recites:

"conveying the dither detected at the second optical component and information identifying the second optical component to the processing agent".

As discussed above, there is no disclosure of any processing agent as defined in claim 14. As such, there can be no conveying of any dither detected or any information identifying the second optical component to the processing agent.

Claim 14 also recites:

"checking the dither and information identifying the second optical component against the predefined connection model stored in the processing agent to determine if the connection is correct.

With respect, as discussed above in O'Sullivan *et al.* reflections are detected by calculating a ratio of energy between dithers detected in an incoming signal and the energy in a transmitted dither, and there is <u>no</u> checking of any dither and information identifying the second optical component against any predefined <u>connection</u> model stored in the processing agent.

As indicated above, not all claim features of claim 14 are disclosed by O'Sullivan *et al.* and so claim 14 is allowable. The Examiner is respectfully requested to withdraw the 35 U.S.C. 102(b) rejection of claim 14.

<u>Claim 15</u>.

Claim 15 depends on claim 14 and should be allowed for the same reasons as discussed above with reference to claim 14. Furthermore, claim 15 recites:

"wherein the dither is cancelled from the dithered optical signal at the second optical component using destructive interference".

The Examiner has referred to Figures 1 and 2 of O'Sullivan *et al.* as disclosure for this claim feature. With respect, Applicant can find no disclosure of any cancelling of any dither using destructive interference in Figures 1 and 2. Instead, as discussed in column 4, lines 52 to 62 of O'Sullivan *et al.* a "low frequency dither signal D_{ij} is formed at each amplifier using the local codes C_{ij} which encode the intensity of the light of the laser pump with known modulation depth. The codes are selected so that they do not interfere with the codes transmitted by the neighbouring amplifiers and are thus separately measurable". Each amplifier provides a unique dither so that there is no interference with codes transmitted by neighbouring amplifiers. As such, O'Sullivan *et al.* do not teach cancelling of any dither but instead dithers are propagated throughout the system. In particular, as discussed in column 5, lines 14 to 16 a dither signal may comprise dithers from the amplifiers connected upstream from the amplifier under consideration.

The additional features of claim 15 are not taught in O'Sullivan *et al.* The Examiner is respectfully requested to withdraw the 35 U.S.C. 102(b) rejection of claim 15.

<u>Claims 16 and 17</u>

Claims 16 and 17 depend on claim 15 and should be allowed for the same reasons as discussed above with reference to claim 15. The Examiner is respectfully requested to withdraw the 35 U.S.C. 102(b) rejection of claims 16 and 17.

<u>Claim 18</u>

Claim 18 depends on claim 14 and should be allowed for the same reasons as discussed above with reference to claim 14. Furthermore, claim 14 recites:

"wherein the processing agent is control software located remotely from the first and

second optical components".

With respect, as discussed above with reference to claim 14 O'Sullivan *et al.* do not disclose the processing agent defined in claim 14. Furthermore, the Examiner has referred to Figures 1 and 2 of O'Sullivan *et al.* as disclosure for this claim feature of claim 18. Shown in Figure 1 are PM & SSD (Power Monitoring and Self-Stimulation Signal Detection) units 110, 120, 130, and 140 each connected to amplifiers 10, 20, 30, and 40, respectively. As shown in Figure 2 these units are coupled to the amplifiers 10, 20, 30, and 40 through optical taps 31 and 32 (see column 5, lines 50 to 53). These units are used to detect a local dither (see column 5, lines 57 to 59) and there is no disclosure of any processing agent as defined in claim 18 which is control software located remotely.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 102(b) rejection of claim 18.

<u>Claim 19</u>

Claim 19 depends on claim 18 and should be allowed for the same reasons as discussed above with reference to claim 18. Furthermore, claim 19 recites:

"wherein the processing agent is connected to the first and second optical components via electrical backplane connections".

The Examiner has referred to Figures 1 and 2 of O'Sullivan *et al.* as disclosure for this claim feature. With respect, as discussed above with reference to claim 18 in Figures 1 and 2 units 110, 120, 130, and 140 are optically coupled to amplifiers 10, 20, 30, and 40, respectively, and there is no device that is coupled to both first and second optical components via electrical backplane connections.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 102(b) rejection of claim 19.

In paragraph 6 of the Detailed Action, the Examiner has rejected claims 2, 5, 9, and 12 under 35 U.S.C. 103(a) as being unpatentable over Ishimura *et al.* in view of United States Patent

No. 6,005,694 (Liu). Given below is a brief description of the Liu reference followed by a detailed discussion on how claims 2, 5, 9, and 12 are patentable over Ishimura *et al.* and Liu.

Liu

Liu discloses a method and system for detecting optical signal degradation or loss within the optical domain of a fiber network. Optical cross-connect switches (OCCS) are provided at network nodes. Optical data traffic is conducted between nodes via a fiber link. The fiber link extends between respective ports of the optical cross-connect switches at each network node. Dedicated signals for detecting faults are introduced and removed within the optical domain of the fiber communication network. In one embodiment, transmitter/receiver units are coupled directly to the fiber link for broadcasting optical signals for fault detection. In another embodiment, transmitter/receiver units are coupled to the fiber link through one or more dedicated ports within the optical cross-connect switches at network nodes. Optical signals for fault detection are then broadcast or switched through working and/or spare fibers. Distinctive optical fault detection signals are used when the signals are broadcast or switched over working fibers.

To begin, there are three requirements for establishing a *prima facie* case of obviousness: 1) all features must be present; 2) there must be an expectation of a reasonable chance of success; and 3) there must be some suggestion or motivation in the prior art to combine the references. A discussion on how for each of claim 2, 5, 9, and 12 a *prima facie* case of obviousness cannot be established will now be given.

Claim 2

Claim 2 depends on claim 1 and should be allowed for the same reasons as discussed above with reference to claim 1. In particular, the Examiner's rejection of claim 1 is based on the false premise that Ishimura *et al.* disclose all of the claim features of claim 1. As discussed above with reference to claim 1, Ishimura *et al.* do not disclose all of the features of claim 1. Furthermore, Applicant submits that Liu does not disclose the features of claim 1 that Ishimura *et al.* fail to disclose. Therefore, not all of the claim feature of claim 2 are disclosed by the cited references and requirement 1) for a *prima facie* case of obviousness cannot be satisfied.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 2.

Claim 5

Claim 5 depends on claim 1 and should be allowed for the same reasons as discussed above with reference to claim 1. In particular, the Examiner's rejection of claim 1 is based on the false premise that Ishimura *et al.* disclose all of the claim features of claim 1. As discussed above with reference to claim 1, Ishimura *et al.* do not disclose all of the features of claim 1. Furthermore, Applicant submits that Liu does not disclose the features of claim 1 that Ishimura *et al.* fail to disclose. Therefore, not all of the claim feature of claim 5 are disclosed by the cited references and requirement 1) for a *prima facie* case of obviousness cannot be satisfied. Furthermore, claim 5 recites:

"wherein the dedicated communications channel running parallel to the fiber connection is bi-directional".

In the rejection claim 5, the Examiner states "regarding claims 2, 5, 9, and 12, Ishimura teaches all the aspects of the claimed invention as set forth in the rejection to claims 1 and 8 above except fails to teach the dedicated communications channel running parallel to the fiber connection is an optical fiber link separate from the fiber connection". The Examiner appears to be saying that the claim feature of claim 5 is disclosed in Ishimura *et al.*; however, the Examiner has not identified any of the additional features of claim 5 in Ishimura *et al.* Furthermore, Ishimura *et al.* disclose a uni-directional system and Applicant cannot find any disclosure of a dedicated communications channel as defined in claim 5 running parallel to a fiber connection wherein the dedicated communications channel having a parallel to the fiber connection is bi-directional. As such, requirement 1) for a *prima facie* case of obviousness cannot be satisfied.

Furthermore, the Examiner has not provided any details of how modifying Ishimura *et al.* to include a dedicated communications channel running parallel to the fiber connection with the dedicated communications channel being bi-directional could be implemented in the system of Ishimura *et al.* and how such an implementation would be obvious. Applicant submits that there

is no reason to believe that Ishimura *et al.* can be modified to produce the desired result of the invention and requirement 2) for a *prima facie* case of obviousness is not satisfied.

Not all requirements for a *prima facie* case of obviousness are satisfied. The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 5.

Claim 9

Claim 9 depends on claim 8 and should be allowed for the same reasons as discussed above with reference to claim 8. In particular, the Examiner's rejection of claim 9 is based on the false premise that Ishimura *et al.* disclose all of the claim features of claim 8. Applicant submits that Ishimura *et al.* and Liu do not disclose all of the claim feature of claim 8 and therefore not all of the claim features of claim 9 are disclosed by the cited references. As such, requirement 1) for a *prima facie* case of obviousness cannot be satisfied.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 9.

Claim 12

Claim 12 depends on claim 9 and should be allowed for the same reasons as discussed above with reference to claim 9. Furthermore, claim 12 should be allowed for the same reasons as discussed above with reference to claim 5.

Applicant appreciates the Examiner's comment found in paragraph 7 of the Detailed Action which states that claims 4 and 7 would be allowable if rewritten in independent form; however, given the above discussion in favour of claims 1 to 3, 5 to 6, and 8 to 19, Applicant elects not to re-write claims 4 and 7 in independent form.

In view of the forgoing, early favorable consideration of this application is earnestly solicited.

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Date: March 19, 2004

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